25th Annual Conference on the Adirondacks

The Conference Center at Lake Placid, Lake Placid, NY, May 22nd and 23rd, 2018

"25 Years – Research Needs Yesterday, Today, and in the Future"

Paper Abstracts

Gregory, Alex R.[1*]

Modeling Deglaciation And Vegetation Changes Within The Adirondacks

Twenty-two thousand years ago, the Laurentide Ice sheet began to retreat. By at least 13,000 BP the glacially ravaged Adirondacks were free of ice. Though, geomorphological, palynological and macrofossil evidence of deglaciation exists, the process (hydrological and vegetation changes) remains poorly understood. This study uses numerous GIS digital models to reconstruct glacial retreat, hydrological shifts and the changing vegetation patterns that occurred during the Late Pleistocene to Early Holocene transition. Findings from this study suggest the Tupper Lake area can be divided into three primary stages of melt water runoff. These stages may indicate an extreme release of freshwater into nearby lakes and seas, thus, exemplifying the influence that this meltwater had on determining the river ways and streams we recognize today. Following the retreat of the glacier out of the Tupper Lake area around 14,500 BP we see the landscape begin to resemble a tundra. Using pollen and macrofossil data, a series of maps have been produced through GIS that represent changing land cover in the northern Adirondacks through time. Therefore, in conjunction with the deglaciation model, this work illustrates paleoenvironmental shifts in the Adirondacks from Late Pleistocene into the Early Holocene.

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Messner, Timothy C.

Adirondack Archaeology: Piecing Together The Puzzle

Despite nearly a century of inquiry into New York State's ancient past, the Adirondacks have remained an archaeological backwater. According to many professionals and community members, Adirondack history began only centuries ago with the arrival of Euroamerican adventurers and industrialists into what has conventionally been depicted as an empty pristine

mountain wilderness. During the last five years, I have been working to challenge this narrative through joint collaboration with Native and state officials affiliated with local museums, talking with artifact collectors, and conducting archaeological testing. In this presentation, I report on recent archaeological findings which highlight a deep history beginning with Early Holocene hunters and gatherers in a newly deglaciated landscape. The evidence demonstrates that over the next 12,000 years people distributed themselves throughout the uplands even climbing into the High Peaks region. Findings from this research depict a long and intimate connection between people and the Adirondack mountainscape. This study helps provide a more accurate, complex and deep history of the Adirondacks – one with people as part of wilderness.

Department of Anthropology, State University of New York at Potsdam

Craig L Milewski[1]

A Case Study of Freshwater Community Ecology and Shoreline Organic Matter

A comparison of macroinvertebrate communities in near-shore areas at impacted and minimally-impacted sites in Lower St. Regis Lake, and in reference conditions in Black Pond (northern Adirondacks) revealed differences. In Lower St. Regis Lake, the number of macroinvertebrate families residing on woody structure in minimally-impacted sites was twice that found in impacted sites (18 vs 9). Five families classified as scrapers were found on woody structure at minimally impacted sites compared to none in impacted sites. In Black Pond, family richness on woody structure was comparable to the impacted sites in Lower St. Regis Lake (7 vs 9); however, densities found on woody structure in Black Pond was more than twice that in Lower St. Regis Lake. In Black Pond, macroinvertebrate family richness in organic substrates was five times that found in organic substrates in Lower St. Regis Lake (15 vs 3). A comparison of fish densities in near-shore areas at impacted and minimally-impacted sites in Lower St. Regis Lake, and a comparison of fish diets between near-shore and off-shore areas indicate fish communities use near-shore, woody structure for cover and for food. In Lower St. Regis Lake, fish densities were significantly higher in minimally-impacted sites than in impacted sites. Comparisons of stomach content revealed that small fishes (<100 mm) in near-shore areas had a higher frequency of occurrence of macroinvertebrates and a much lower frequency of occurrence of zooplankton compared to small fishes in adjacent, shallow off-shore areas. These findings have implications for shoreline restoration.

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Murphy, Cornelius B. Jr, PhD [1]

An Oligotrophic Lake's Harmful Algal Bloom Impact and Response

Skaneateles Lake has historically recorded orthophosphate concentrations in the range of 5 to 6 ug/l. The pearl of the Finger Lakes havi ng no point source wastewater discharges and a AA water quality classification encountered a bloom of cyanobacteria in September of 2017. This followed intense storms in the month of June and early July. The story of Skaneateles is even more complex. As a deep cold water oligotrophic lake with very low nutrient water column concentrations, it has no history of cyanobacteria blooms. The Lake and Watershed nutrient management plan is being developed. Cause of the bloom is clearly more than the water column total phosphorus concentration but also about phosphorous speciation and sediment release as well as high water column temperatures. The course of the Harmful Algal Bloom and its impact on water quality and its possi ble impact the City of Syracuse drinking water filtration waiver is dependent upon both good science and on the timely application of Best Management Practices in the Watershed. Will the multispectral scanner on NASA's LANDSAT satellite and drones be part of the early warning system? Can ultrasonic devices be deployed in the early stage of a developing bloom reduce its impact? Can advanced oxidation systems effectively destroy the microcystins and protect the potable water consumers? And lastly, can precision agriculture be at the heart of a nutrient reduction program?

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Schoch, Nina[1*], Jorie **Favreau**[2*], Lynn **Miller**[3*], Lee Ann Sporn[2], Beth **Hershenhart**[4*]

Adirondack Wildlife Health Institute – Bringing Conservation Medicine to Northern New York

The proposed Adirondack Wildlife Health Institute will provide state of the art care for injured wildlife; high quality wildlife health and conservation medicine training for wildlife rehabilitators, students, and veterinary personnel; conduct conservation medicine research to address concerns affecting the health of wildlife populations; explore the connections between wildlife, human, and domestic animal health; and inspire public appreciation of the natural history of New York's wildlife, as well as enhance awareness of environmental conservation in and around New York's Adirondack Park. The Institute would be based at Paul Smith's College and will create a unique avenue of training, research, monitoring, and hands-on experience in wildlife rehabilitation for college students, preparing them for graduate work or careers in conservation medicine, veterinary medicine, public health, and wildlife health.

The goals of the Adirondack Wildlife Health Institute are to:

(1) Fill a void in quality wildlife rehabilitation care in northern New York, including a wildlife oil spill response facility and a rabies vector treatment facility;

(2) Provide a state of the art training and research resource for: wildlife rehabilitators; veterinary, medical, and wildlife professionals and students; elementary, middle, and high school

students; and volunteers;

(3) Complement other environmental organizations in the Adirondack Park with an environmental education and training facility focusing on human-wildlife interactions, One Health, and conservation medicine;

(4) Increase awareness about the links between human health, animal health, and the environment; and

(5) Expand tourism and student opportunities in the North Country by providing a unique wildlife training, research, and education facility for visitation.

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Stager, Curt[1*], Brendan **Wiltse**[1], Brian **Cumming**[2], Thomas **Holsen**[3], and Jonathan **Stetler**[1,4].

Sediment cores reveal post-acidification changes in the ecology of Bear Pond.

Diatoms in sediment cores from Bear Pond representing the last 200 years show that the lake acidified during the early to mid-20th century when many other Adirondack lakes also acidified. Some planktonic diatom species that had declined during that acidification period are now increasing again, but the lake is not returning to its pre-acidic condition. It is instead entering a novel ecological state that may be unique in its history and that appears to be at least partially the result of climatic changes. The remains of chrysophyte algae have become abundant in the sediments during the last 2 decades, the once-clear blue water has become murkier and more brown in color, water levels have risen, and residues of toxaphene from a reclamation half a century ago are still present in the sediments and may be leaking into the water column. Despite signs of chemical recovery from acidification in terms of pH, these recent changes have compromised some of the lake's formerly exceptional recreational features.

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Stickles, James H.[1*], Jeremy E. **Hurst**[1], Sharon L. **Tabor**[1], Paul G. **Jensen**[1], Jacquelin L. **Frai,** Angela K. **Fuller3, Sam Peterson**[2], Alec **Wong**[3]

Moose Research in the Adirondack Park

Since the 1980s, moose *(Alces alces)* have been recolonizing New Yorl(State. NYSDEC has monitored public sightings and moose-vehicle collisions ·as indices of p.opulation abundance and distribution, and to collect general health data. However, unlike other areas of the northeastern U.S. where moose populations have experienced rapid growth following recolonization, moose population growth in New York has been slow. To estimate moose population abundance and demographic rates, NYSDEC has initiated several research projects in cooperation with universities and other partners. During January 201 5-201 7 we instrumented 26 moose (23 females, 3 males) in the Adirondack Park with OPS collars to estimate space use, adult survival, calf production and survival, and determine browse selection. Additionally, during the winters of 2015-201 8, we conducted aerial transect surveys to determine moose distribution, estimate population size, and develop a protocol for monitoring moose population abundance. During the summers of 2016 and 2017, we used trained detection dogs to locate and collect moose scat; data from this effort \¥ill be used to estimate abundance and provide insight on nloose diet and healt.h. Preliminary results indicate -400 moose in the Adirondack park With a clustered distribution and a cow to calf ratio of -0.8 for collared cows. Collectively, these research projects will be used to inform a moose management plan for New York State.

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Simpson, Benjamin D.**[1*], James H.** Stickles[1].

The Unique Challenges Of Managing Human-Bear Interactions in the Adirondack Park

As biologists, we face the challenge of managing human-bear conflicts and interactions in a unique area of the country. The state of New York's wildlife is managed by the New York State Department of Environmental Conservation. The state is broken up into 9 regions with Region 5 containing the majority of the Adirondack Park. The Adirondack park covers over 5.8 million acres of land in the northern half of New York State. The park consists of 2.9 (50%) million acres of private land and 2.6 (44%) millions acres of public. The mix of public and private land and a bear population over 4,500 has led to conflicts. In Region 5, we receive between 150-200 phone call complaints per year, mostly regarding bird feeder and residential trash. In the last 5 years (2013-2017) the high-peaks wilderness has seen, on average, 120,879 trail visitors per year. These visitors include day users and overnight campers. A state law requiring the use of bear canisters has curbed some conflict issues but the sheer number of visitors across a huge landscape continues to have its problems. Along with requiring bear canisters for overnight stays in the High-Peaks Wilderness, we have used other means of managing bear-human conflicts throughout the region. We have utilized electric fencing, electric backpacks, trapping, removal, hazing, and public education. I present some of the means we use to deal with these conflicts as well as show some of the unique challenges we face as managers.

[1]New York State Department of Environmental Conservation, Division of Fish, Wildlife and Marine Resources, 1115 State Route 86, Ray Brook, New York

Smemo, Kurt[1*], Christopher **Blackwood**[2], Richard **Phillips**[3], and Andrew **Eager**[2].

Soil Fungi, Dominant Trees, And Integrated Ecosystem/Community Dynamics Across The Adirondacks.

Recent studies have highlighted forest tree traits as regulators of ecosystem processes. Many of those studies have focused specifically on the mycorrhizal association of dominant trees as a fundamental driver of biogeochemical cycling. However, environmental and abiotic factors related to climate, soil, and land-use are also considered master variables that control a diverse array of ecosystem dynamics. Moreover, soil pathogens might play a key role in dictating the distribution of dominant trees in forest communities. Studies that examine the relative influence of mycorrhizal tree types, plant-microbe feedbacks, and environmental controls across natural gradients as a means to predict consequences of environmental change and altered biodiversity are clearly needed. We argue that the Adirondacks are an ideal system for studying such relationships due to the small number of overstory tree species, distinct climatic gradients, and relatively uniform geology. We began establishing permanent sampling plots in 4 distinct regions of the Adirondacks that vary with respect to climate, but have similar tree communities and land-use history. At each site, 24 15-m radius plots (12 on south and 12 on north aspects) are centered on a dominant focal tree with the goal of varying mycorrhizal tree dominance from near 0 to near 100% ectomycorrhizal (ECM). We conclude so far that specific mycorrhizal distribution patterns are apparent across short distances and provide support for hypothesized patterns of carbon and nutrient cycling related to tree functional traits. We will also explore conceptual frameworks, future directions, and long-term goals for this collaborative project.

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[2]Department of Biological Sciences, Kent State University
[3]Department of Biology, Indiana University

Wiltse, Brendan[1]*, Corey. L. **Laxson**[2], Nicole C. **Pionteck**[1], & Elizabeth C. **Yerger**[2]

Road Salt Interrupts Turnover Of Mirror Lake (Lake Placid, NY)

Mirror Lake, located in the Village of Lake Placid, is one of the most urban lakes in the Adirondack Park. The lake receives direct stormwater runoff from the Village through a network of over 25 stormwater outfalls. This stormwater delivers high loads of road salt directly to the lake. The objective of this research was to understand the impact of road salt on Mirror Lake. Specifically, we sought to understand an apparent lack of spring turnover observed in 2015 and 2017. We studied the lake on a bi-weekly to monthly basis for two and a half years to

understand the spatial and temporal variation in chloride concentrations within the water column of the lake. Our results show surface water chloride concentrations ranging from 36 to 54 mg/L, while bottom water concentrations range from 48 to 123 mg/L. Elevated bottom water chloride concentrations appear at the same time as winter and spring runoff events. In 2015 and 2017 these elevated concentrations persisted throughout the summer until fall turnover. The persistently elevated chloride concentrations during these two years indicate that the lake did not completely mix in the spring. This implies that salt induced density differences contributed to the lack of spring turnover in 2017. To the best of our knowledge, this is the first documented case of salt induced inhibition of spring turnover in the Adirondacks. The disruption of this critical physical process has the potential to impact internal nutrient cycling and habitat availability for cold water species.

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POSTERS

Schoch, Nina[1], **Valerie L. Buxton[1]*,** John Ozard[2], Dan Rosenblatt[2], David Evers[3], Michale Glennon[4], Paul P. Calle[5], and Keith Grasman[6]

20 Years of Collaborative Research, Outreach, and Conservation of Adirondack Loons

Research efforts on Common Loons (Gavia immer) in New York's Adirondack Park were initiated in 1998, borne out of concern for the toxic effects of mercury exposure on loon populations and the aquatic ecosystems they inhabit. Since this time, Adirondack loon research has expanded to encompass studies on multiple aspects of loon ecology, behavior, health, and conservation in the Park. Each breeding season, we monitor > 90 Adirondack lakes for more than 250 uniquely color-banded loons, and capture, band, and sample ≥ 10-15 loons on our study lakes to assess loon productivity, health, and mercury exposure. Additionally, we have used satellite telemetry and geolocators to identify migratory patterns of Adirondack loons, placed trail cameras at loon nesting sites to better understand incubation behavior and factors affecting nesting success, and rescued debilitated loons. Here we present a brief summary of this work, and highlight how our research has informed loon conservation and management in the Adirondack Park, and contributed to enhancing public awareness and understanding of wildlife conservation, utilizing the Common Loon as an indicator species.

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3Biodiversity Research Institute, 276 Canco Rd., Portland, ME 04103

4Wildlife Conservation Society, Adirondack Program, 132 Bloomingdale Ave., Suite 2, Saranac Lake, NY 12983

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GIS Optimization for an Adirondack to Algonquin (A2A) Corridor

Justin Davis, Clarkson Adirondack Semester Research Team

Ecosystem connectivity is a critical part of broader efforts to protect wildlife, biospheres, and to protect against habitat fragmentation, especially in terms of human activity. Isolation of natural areas due to human development can have detrimental effects on overall biodiversity and health of ecosystems. The A2A wildlife corridor is a naturally occurring ecosystem corridor between the Adirondack Park and Algonquin Provincial Park in Ontario, Canada. As part of a broader team effort to assess the possible implementation of an A2A Corridor, we analyzed a wide variety of factors to optimize the best possible routes for an A2A corridor on the New York side of this eco-sphere system. Our optimization analysis also enabled us to use information on roadkill density to target specific human barriers that the A2A corridor faces.

Implementing and using ArcMap software we assessed a variety of several factors to determine the most optimal pathways for a possible wildlife corridor. These include large urban areas (Canada side), easements, land cover, stream crossings, rail crossings, road density, and distance considerations. A weighted overlay model was developed based on qualitative assessments of these factors which produced three optimal paths. We discuss challenges in data access, data cleaning, and other factors that affect these optimization choices.

Robert G. Frawley, M.A. Interim Executive Director, Adirondack Birth to Three Alliance

Child Health and Well-Being in the Adirondacks

Abstract: The Adirondack Birth to Three Alliance is working to bring the resources of all programs and services for young children and their families together to help children to become healthy, thriving, and contributing members of the Adirondack community. The Alliance does this work by focusing on three goal areas: Healthy Children, Strong Families, and High-Quality Early Learning.

To begin a larger effort to measure the success of its work, a data report has been written to establish the baseline using regional and county data on indicators in each of the three focus areas. The data includes both population data, such as the number of children birth to three in the region and number and percent of children living in poverty, and program data, such as the number of children enrolled in early childhood education programs. Because we are establishing a baseline, the report uses primarily 2015 data, which is the year the Alliance was established. Where available and meaningful, it includes comparisons to data for the state as a whole and the area of the state outside of New York City There has been no attempt to be exhaustive, there is far more data that could be reported. Instead efforts have been made to identify the key indicators of child and family well-being that the Alliance would hope to positively influence over time. This is done with full awareness that many of these indicators are not likely to change over a short time period.

Establishing an Adirondack to Algonquin (A2A) Corridor in the North Country

Wil Hallstrom, Clarkson Adirondack Semester Research Team

Ecosystem connectivity is crucial to maintaining healthy and stable wildlife populations, especially in the face of climate change and global human development. This is certainly the case for the Adirondacks and the broader ecosystem region beyond the Park. The A2A wildlife corridor is a naturally occurring ecosystem corridor between the Adirondack Park and Algonquin Provincial Park in Ontario, Canada. Our research team addressed the reduction of habitat fragmentation throughout the A2A region and worked in partnership with the Algonquin to Adirondack Collaborative to identify future actions to implement the A2A corridor in the North Country.

We address three areas of greatest impact: data collection & analysis, public outreach, and economic & social institutions. Categories were prioritized by assessing the most immediate needs and greatest challenges for an A2A corridor. We provide recommendations on data collection efforts via citizen science, route optimization analysis through ArcGIS mapping, and the design and implementation plans for wildlife road crossings. The public outreach team recommends the use of landowner surveys to gauge opinions regarding conservation, creation of an outreach program and pamphlet design, and effective social media campaigns. Institutionally, we recommend the promotion of conservation easements, creating a 501(c)(3) organization in New York State, developing a UNESCO Biosphere Reserve, and identifying synergistic economic opportunities throughout the region. Our analysis for the A2A Collaborative demonstrates that clear potential exists through these avenues to develop such a corridor, but it will require a sustained and long-term effort with significant economic resources to do so.

Brewer, Matthew J.[1], **Justin R. Minder*[1]**, and Sara Lance[2]

Evaluating Predictions of Cloud Base Height against Observations on Whiteface Mountain

Predicting cloud base height over mountainous terrain is important for wide ranging applications such as forecasts for outdoor recreation and studies of acid deposition by cloud water. Cloud base was an key forecast parameter during the recent Chemical Processing of Organics within Clouds (CPOC) field campaign at Whiteface Mountain (WFM) in the Adirondacks from 11-25 August 2017. This parameter was important during CPOC as the project aimed to make measurements of air composition below cloud on WFM while within cloud measurements were taken at the WFM summit.

In this study, we investigate the skill of two methods of predicting cloud base over WFM by comparing observations of cloud base against short term forecasts ("nowcasts") based on nearby surface station observations and forecasts from a numerical weather model.

Observational estimates of cloud base height were made from images collected by a web cam located in Lake Placid, New York, which give a good view of the mountain and its known features. Observational nowcasts of cloud base were made by computing the lifted condensation level from surface observations collected by the Whiteface Mountain Base station of the New York State Mesonet on the northeast side of WFM. Numerical forecasts of cloud base were taken from the high-resolution NCAR Ensemble weather model, with 3-km grid spacing, run every day at 0000 UTC with a 48-h forecast.

Statistics from multiple case studies during summer 2017 are presented to quantify the skill of each prediction method. Individual days are analyzed to understand the limitations and biases of each method.

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Sporn, Jacob[1]

"Environmental marketing and the future of the world as a product."

Twenty-five years of innovation, including advanced communications networks, increased availability of technology and constantly-shifting global trends has shaped a new world of marketing. From door-to-door marketing (like Avon), to videos for the masses on social platforms, these global changes have affected how marketers present information. Now, billions of people have immediate access to news, products and personal contacts across the world. How do environmental marketers fight for the spotlight? How do they sell the world as a product? The Adirondack Watershed Institute (AWI) reflects on changes that it made to adapt to this new world of marketing.

[1]Adirondack Watershed Institute, Paul Smith's College, Paul Smiths, NY 12970

· Jorie Favreau: BirdSafe NY

· Lee Ann Sporn can not attend, but is working with Jake and a student that worked on the project to put together an overview of the Lyme's disease/tick research

· Joe St. Cyr (graduating senior) will present his poster on "An Investigation of Long Term Monitoring Data of Fishes in Lower St. Regis Lake and Smitty Creek Watershed." He worked with Taylor West and Craig Milewski, and while Taylor can not attend, Taylor and Craig are updating Taylor's poster to include an overview of the long term project, and Joe will also present that.

· Reinvigoration of the Champlain Adirondack Biosphere Reserve (Nicholas Coolidge)

· Nick Yerden: Lidar Derived Landscape Characteristics

· Matt Spadoni: Landslide Potential in the ADK

· Nico Pettrella and Scott Sidney: The Reintroduction of an Adirondack Native: The American Elm

· Hunter Weber: Locating American Woodcock on and around Paul Smith's College

· Chelsea TurWilliams and Chris Jagliewski: Identifying Locations for Solar Panels

· Two posters with no students able to attend. I need to get poster names (one is the geometric network for the St. Regis Watershed, the other is another lidar derived canopy indices from Creighton Hill).